

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference OPP050258KR	FOR FURTHER ACTION		See Form PCT/IP/4418
International application No. PCT/KR2005/000888	International filing date(day/month/year) 25 MARCH 2005 (25.03.2005)	Priority date (day/month/year) 26 MARCH 2004 (26.03.2004)	
International Patent Classification (IPC) or national classification and IPC C07K 14/435(2006.01)i, C12N 15/12(2006.01)i			
Applicant POSTECH Foundation et al			

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box relating to Sequence Listing (see Section 802 of the Administrative Instructions).
- This report contains indications relating to the following items:
 - ☒ Box No. I Basis of the report
 - ☐ Box No. II Priority
 - ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - ☐ Box No. IV Lack of unity of invention
 - ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - ☐ Box No. VI Certain documents cited
 - ☐ Box No. VII Certain defects in the international application
 - ☒ Box No. VIII Certain observations on the international application

Date of submission of the demand 26 SEPTEMBER 2005 (26.09.2005)	Date of completion of this report 13 JULY 2006 (13.07.2006)
Name and mailing address of the IPEA/KR Korean Intellectual Property Office 920 Dunsan-dong, Seo-gu, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer PARK, JEONG UNG Telephone No. 82-42-481-8159

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☒ This report is based on translations from the original language into the following language English, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the claims:
- pages _____ as originally filed/furnished
- pages* _____ as amended (together with any statement) under Article 19
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the drawings:
- pages _____ as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**I. Statement**

Novelty (N)	Claims	2-9, 11-49	YES
	Claims	1, 10	NO
Inventive step (IS)	Claims	2-9, 11-49	YES
	Claims	None	NO
Industrial applicability (IA)	Claims	1-49	YES
	Claims	None	NO

2. Citations and explanations (Rule 70.7)

This present invention relates to a bio-adhesive derived from mussel, and more particularly to a novel *Mytilus galloprovincialis* foot protein-5(MGFP-5) and a recombinant protein that is a hybrid of MGFP-5 and foot protein-1(FP-1).

The following documents have been considered for the purpose of this report:

D1: NCBI Accession No. AAS00463 (Feb. 01, 2004)

D2: US 5202236 (Apr. 13, 1993)

1. Novelty

Claims 1 and 10 describe an MGFP-5 gene and protein. The protein of the present invention are useful in enhancing plant tolerance to cold, salt or drought stress when the protein is overexpressed in the plant. However, document D1 discloses a foot protein-5 from *Mytilus galloprovincialis* which has the same sequence with the present invention. Therefore, the subject-matter of claims 1 and 10 is not considered to be novel under PCT Article 33(2).

2. Inventive Step

D1 provides the same sequence with claims 1 and 10 of the present invention. D2 discloses application of the techniques of recombinant DNA technology to the production of bioadhesives of the type produced by marine animals such as mussels, barnacles and oysters. In this present invention, a recombinant protein that is a hybrid of MGFP-5 and foot protein type 1(FP-1), and a method of producing an adhesive protein is not described in any of the prior art. Therefore, the subject-matter of claims 2-9 and 11-49 is considered to involve an inventive step under PCT Article 33(3).

3. Industrial Applicability

The subject-matter of claims 1-49 is considered to be industrially applicable under PCT Article 33(4).

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claims 2 and 12 do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The term "a peptide for improving a physicochemical property of the adhesive protein" in claims 2 and 12 has no clear signification.